



PC = Point of Curvature
 PI = Point of Intersection of the
 Extended Tangents
 PT = Point of Tangency
 Δ = Central Angle or External
 Deflection Angle
 R = Radius of Curve
 T = Tangent of Curve
 L = Length of Curve
 (circular arc)
 E = External of Curve
 M = Mid Ordinate of Curve
 LC = Long Chord

$$L = \frac{\Delta R}{57.2958}$$

$$T = R \tan \left(\frac{\Delta}{2} \right)$$

$$E = R \left(\sec \left(\frac{\Delta}{2} \right) - 1 \right) = R \operatorname{exsec} \left(\frac{\Delta}{2} \right)$$

$$M = R \left(1 - \cos \frac{\Delta}{2} \right) = R \operatorname{vers} \left(\frac{\Delta}{2} \right)$$

$$LC = 2 R \sin \left(\frac{\Delta}{2} \right)$$

Figure 4-2: Circular Horizontal Curve